

What is Claimed is:

5 1. A structure of a driving unit in a drum type washing machine comprising:
a tub of plastic including an opened front, a closed rear wall, and a side wall extended
from a periphery of a rear wall to be cylindrical, and a thickness of the rear wall being thicker
than that of the side wall;
a drum mounted rotatably in the tub;
a hollow metal bearing housing integrated in a central portion of the rear wall of the tub;
a shaft passed through the bearing housing, the shaft having one end connected to the
drum and the other end connected to a rotor of the motor;
10 bearings mounted between the shaft and the bearing housing for supporting the shaft;
a stator of a crown form fixed at a central portion of the rear wall of the tub, the stator
including a magnetic core having a stack of layers of magnetic material and a winding part
having a coil wound thereon for forming a magnetic force; and,
15 a rotor including a back- yoke for forming a flux, a permanent magnet fixed to the back
yoke, and a rear wall integrated with the back yoke.

2. A structure as claimed in claim 1, wherein the metallic bearing housing is mounted at
a central portion of the rear wall of the tub of plastic as one unit by insert injection molding.

3. A structure as claimed in claim 1, wherein the metal bearing housing is formed of an
alloy of aluminum.

4. A structure as claimed in claim 1, wherein the bearing housing has steps on front and

rear portions of inner circumference thereof for supporting a front bearing and a rear bearing respectively positioned on the inner circumference of the bearing housing for preventing respective bearings from being fallen off the bearing housing.

5. A structure as claimed in claim 1, wherein, of the steps, a step formed at a front portion of the inner circumference of the bearing housing has a "┐" form for forming a structure which supports a rear end of the front bearing mounted on a front end portion of the shaft among the bearings mounted on opposite end portions of the outer circumference of the shaft, and, of the steps, a step formed at a rear portion of the inner circumference of the bearing housing has a "└" form for forming a structure which supports a front end of the rear bearing mounted on a rear end portion of the shaft among the bearings mounted on opposite end portions of the outer circumference of the shaft.

6. A structure as claimed in claim 1, wherein the shaft has a front end portion fixed to a spider in the rear wall of the drum, and a region from a portion exposed to outside of the spider to the front bearing with a brass bushing press fit thereon for prevention of shaft rusting.

7. A structure as claimed in claim 1, further comprising a supporter inserted between the rear wall of the tub and the stator fixed to the rear wall, for making stable fixing of the stator to the tub despite of vibration of the tub and prolonged use.

8. A structure as claimed in claim 1, wherein the rotor is formed of steel or steel alloy plate.

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9. A structure as claimed in claim 1, wherein the rotor includes;
a bent portion formed along a circumference thereof having a setting surface for supporting magnets fitted to an inside of a front portion of a sidewall extended forward from a periphery of a rear wall, and

5 a hub at a center of the rear wall having a through hole for fastening members for coupling the rotor to the shaft.

10. A structure as claimed in claim 1, wherein the rotor includes;
a plurality of cooling fins integrated with the rear wall thereof each formed in a radial direction thereof by lancing to have a length and be directed toward an opening thereof for blowing air toward the stator for cooling down a heat generated at the stator when the rotor is rotated, and

a plurality of through holes formed by the lancing for ventilation.

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11. A structure as claimed in claim 10, wherein the rotor further includes;
an embossing between adjacent cooling fins on the rear wall of the rotor for reinforcing the rotor, and

15 a drain hole in each of the embossings, for drain of water.

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12. A structure as claimed in claim 1, wherein the rotor further includes;
a hub at a center of the rear wall having a through hole for fastening members for coupling the rotor to the shaft, and

20 fastening holes and positioning holes both formed around the through hole in the hub of

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the rotor at fixed intervals, the fastening holes for fastening a connector serration coupled to an outer circumference of the rear end portion of the shaft exposed to rear of the rear bearing, and the positioning holes for positioning an assembly position of the connector.

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13. A structure as claimed in claim 12, wherein the connector further includes;

5 a serration formed in an inner circumference of the connector hub matched to the serration formed in the rear end portion of the shaft, and

reinforcing ribs on an outer circumference of the connector hub for reinforcing the hub.

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14. A structure as claimed in claim 12, wherein the connector is formed of plastic having a vibration mode different from the rotor.

10 15. A structure as claimed in claim 1, wherein the tub includes;

a hub integrated therewith in the rear wall thereof, the hub having the bearing housing inserted therein, and

fastening bosses on an outer side of the hub along a circumferential direction at fixed intervals for fastening the stator to the rear wall of the tub with fastening members.

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15 16. A structure as claimed in claim 1, wherein the magnetic core of the stator has segregated core pieces.

17. A structure of driving unit in a drum type washing machine comprising:

a tub of plastic mounted inside of a cabinet;

a metallic bearing housing inserted and built in a central portion of a rear wall of the tub having steps of "7" and "1" forms on an inner circumference for supporting bearings therein;

a shaft connected to a drum mounted inside of the tub for transmission of a driving power from a motor to the drum, having a front end portion fixed to a spider in the drum rear wall, a brass bushing press fit on a region of the shaft from a portion exposed in rear of the spider to the front bearing for prevention of rusting of the shaft, and steps on an outer circumference thereof for fixing mounting positions of the front bearing and the rear bearing on the shaft;

bearings mounted on the outer circumference of the shaft at opposite end portions thereof respectively;

a rotor of steel or steel alloy plate coupled to the rear end portion of the shaft, including a bent portion formed along a circumference thereof having a setting surface for supporting magnets fitted to an inside of a front portion of a sidewall extended forward from a periphery of a rear wall, and a hub at a center of the rear wall having a through hole for a fastening member, such as a bolt, for coupling the rotor to the shaft, a plurality of cooling fins formed around the hub in a radial direction each with a length for blowing air toward the stator when the rotor is rotated for cooling down a heat generated at the stator, an embossing between adjacent cooling fins on the rear wall of the rotor for reinforcing the rotor, and a drain hole in each of the embossings, for drain of water;

a stator composing the motor together with the rotor, fixed to the tub rear wall inward of the rotor;

a connector of plastic provided between the shaft and the rotor for transmission of a rotating force from the rotor to the shaft for rotating the shaft and the rotor together; and,

a supporter fitted between the rear wall of the tub and the stator for supporting the stator

and maintaining a concentricity when the stator is mounted to the tub rear wall.

18. A structure of driving unit in a drum type washing machine comprising:

a tub mounted inside of a cabinet;

a drum mounted inside of the tub;

a shaft connected to the drum mounted inside of the tub for transmission of a driving force from a motor to the drum;

a front bearing and a rear bearing mounted on an outer circumference of the shaft at opposite end portions thereof, respectively;

a metallic bearing housing built in a central portion of a rear wall of the tub for supporting the front bearing;

a rotor composing the motor together with the rotor, and coupled to the rear end portion of the shaft;

a stator fixed to the tub rear wall inward of the rotor to compose the motor together with the rotor;

a connector serration coupled to the outer circumference of the shaft in front of the rear bearing and fixed to the rotor, for transmission of a rotating power from the rotor to the shaft; and,

a bearing bracket fixed to the rear wall of the tub to cover an outside of the rotor and support the rear bearing.

19. A structure as claimed in claim 18, wherein the metallic bearing housing is mounted at a central portion of the rear wall of the tub of plastic as one unit by insert injection molding.

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20. A structure of driving unit in a drum type washing machine comprising:
a tub of plastic mounted inside of a cabinet;
a metallic bearing housing inserted to built in a central portion of a rear wall of the tub
having steps on an inner circumference for supporting bearings therein;
5 a shaft connected to a drum mounted inside of the tub for transmission of a driving power
from a motor to the drum, having a front end portion fixed to a spider in the drum rear wall, and
a brass bushing press fit on a region of the shaft from a portion exposed in rear of the spider to
the front bearing for prevention of rusting of the shaft;
bearings mounted on the outer circumference of the shaft at opposite end portions thereof,
10 respectively;
a rotor of steel or steel alloy plate coupled to the rear end portion of the shaft, including
a bent portion formed along a circumference thereof having a setting surface for supporting
magnets fitted to an inside of a front portion of a sidewall extended forward from a periphery of
a rear wall, and a hub at a center of the rear wall having a through hole for a fastening member,
15 such as a bolt, for coupling the rotor to the shaft, a plurality of cooling fins formed around the
hub in a radial direction each with a length for blowing air toward the stator when the rotor is
rotated for cooling down a heat generated at the stator, an embossing between adjacent cooling
fins on the rear wall of the rotor for reinforcing the rotor, and a drain hole in each of the
embossings, for drain of water;
20 a stator composing the motor together with the rotor, fixed to the tub rear wall inward of
the rotor;
a connector of plastic provided between the shaft and the rotor for transmission of a
rotating force from the rotor to the shaft for rotating the shaft and the rotor together;

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a supporter fitted between the rear wall of the tub and the stator for supporting the stator and maintaining a concentricity when the stator is mounted to the tub rear wall; and,

a bearing bracket fixed to the rear wall of the tub to cover an outside of the rotor and support the rear bearing.

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